

1 **Inflammation
Friend and Foe**

Spring Semester
May 3, 2016

2 **1. Inflammation
2. Immune System
3. Leaky Gut
4. Inflammatory Process in the Mitochondria
5. Inflammation and Brain
6. Supplements**

3 **Inflammation**

- ▶ Inflammation both friend and necessary foe
- ▶ The body's chemical response of the immune system to foreign pathogens or injury.
- ▶ Injury causes inflammation
- ▶

4 **Types of Immunity**

- Most acquired immunity is created in childhood by chickenpox, measles and other common childhood diseases or by inoculation. In this case a specific antigen is created against that specific pathogen.
-
- Innate immunity, on the other hand is the body's natural defence against an injury or response to the degeneration of a joint or tissue at the cellular level.

5 **Acquired Immunity**

6 **Stages of Innate Inflammation**

When an injury occurs to a tissue or a chemical assault damages an internal tissue, a cascade of enzymes acting upon some proteins present in the capillaries and interstitial fluid begin the process of change at the site of the injury.

1. Walls of the capillaries at the site expand and become more permeable allowing for an increase of blood and its contents at the site

7 **Stages of Innate Inflammation ..**

2. Some enzymes acting upon a protein called fibrinogen converts it to one called fibrin which forms a net around the site of the damage.
3. Other enzymes cause platelets to change their shape and become caught in the fibrin.

8 **Stages of Innate Inflammation ..**

4. Red blood cells join the complex which is then the makings of a scab if it occurs on the skin, or a clot if it occurs internally.

5. This entire process calls into action a group of inflammatory enzyme acting proteins.

6. Once this process is complete then another group of anti-inflammatory enzyme acting proteins are produced to end the process.

9 **Stages of Chronic Inflammation ..**

7. In the case where damage to a tissue prevents it from performing its designed function such as the deteriorating cartilage in an articulating joint, or the vili in the walls of the intestine due to a continuing inflammatory process, or the internal walls of the arteries due to the acidic effect of high blood sugar unable to be cleared, then the inflammatory process becomes chronic.

10 **Chronic Inflammation**

- ▶ Delayed Onset
- ▶ Weeks-months duration
- ▶ Cardinal signs not typically present
- ▶ Causative agents: Persistent infection, Presence of foreign bodies, Autoimmunity
- ▶ S/S: Low grade, fever, loss of weight, type B symptoms

11 **Stages of Chronic Inflammation**

The nuclei of your body cells are equipped with sensors to detect when something goes wrong. Triggers that activate the sensors can either be environmental or internal. In the case of an inflammatory chronic condition we are discussing here the cell's nucleus is able to produce an enzyme like protein complex called NF kappa beta feed back loop. This new player is brought into action when your body is in danger of escalating into serious trouble.

12 **Triggers (causes) of Inflammation**

1. Nutritional
2. Internal
3. Environmental

13 **Triggers (causes) of Inflammation ..**

1. Nutritional
 - Glutton
 - lactose (milk sugar)
 - excess refined sugar
 - the collective preservatives of microwaveable, prepared meals.

14 **Triggers (causes) of Inflammation ..**

- Internal
- ▶ G.I. Disease
 - ▶ Infections
 - ▶ chronic stress
 - ▶ Obesity
 - ▶ Adrenal function - excessive cortisol production

- ▶ Hyper insulinemia

15 **Phases of the Inflammatory Process**

- ▶ Phase I: Acute Phase (2 sub phases)
 - Early (Acute): inflammatory response: lasts 2-4 days
 - Late (Sub-Acute): continue inflammatory phase which is usually complete in 2 weeks
- ▶ Phase 2: Tissue Formation (Proliferation)
 - Tissue rebuilding approximately 2-3 weeks
 - This does not include chronic inflammation
- ▶ Phase 3: Remodeling Phase
 - Adapt to original tissue
 - Continues for up to 1 year post injury

16 **2. Immune System**

17 **Types of Immunity**

- Innate (nonspecific) – 1st line of defense
 - Anatomic barriers (e.g., skin and mucous membranes)
 - Physiologic barriers (body temp., low pH in stomach)
 - Phagocytic cells (granulocytes)
 - Inflammation
- Acquired (specific):
 - Activation of white blood cells (lymphocytes)
 - Develops following exposure to certain *pathogens*

18 **3. Leaky Gut**

19 **IBS: Irritable Bowel Symptoms**

- ▶ IBS is a typical common malady affecting many people without they're even being aware of it since it exists often without any symptoms
- ▶ produces silent inflammation which is subclinical and does not cause detectable CRP (C-Reactive Protein)

20 **IBS: Causes and Triggers**

- ▶ food sensitivities
- ▶ Allergies
- ▶ toxic substances such as agricultural pesticides and GMO foods.
- ▶

21 **IBS & Leaky Gut**

- ▶ Since the inflammatory process is begun even at such a non-perceptible level, the first stage of the process beginning with the increased permeability of the capillary walls in the small intestines as described earlier, creates what is termed a "leaky gut" syndrome.

22 **IBS & Leaky Gut**

- ▶ This permits larger molecules of undigested food to move directly from the intestine to the blood where it causes more inflammation.
- ▶ Since the arterial blood system can be termed an internal highway carrying all substances including inflammatory proteins, it can be assumed the inflammatory process can begin

anywhere in the body where it is vulnerable.

23 **Leaky Gut & Microbiome**

- ▶ micro biome or bacteria that live within us
- ▶ they represent approximately 90% of our body weight (our own bodily cells only 10% of our bodily weight).
- ▶

24 **Leaky Gut & Microbiome**

- ▶ foods high in fibre and fermented foods play a major role in feeding the beneficial bacteria.
- ▶ This also appears to have a major effect on healing inflammation.
- ▶ Add a good quality probiotic to the arsenal of orthomolecular AIDS would be wise.

25 **Microbiome & Prebiotics**

- Foods that contribute to your body's ability to make the bacteria by fermentation within your body are called pre-biotics.
- ▶ Roots; chicory, yams, agave, carrots, beets, onion, garlic, leaks, turnip, and celery.
 - ▶ Vegetables; artichoke, asparagus, broccoli, spinach, kale, lettuce, cauliflower, spinach, zucchini, tomato and cucumber.

26 **Microbiome & Prebiotics**

- ▶ Whole grains; brown rice, sprouted wheat, quinoa, oats, rye, barley, millet and kasha.
- ▶ Legumes; soy, peas, black and red beans, garbanzo beans.
- ▶ Fruit; citrus, grapes, banana, pear, plum, Peach, Apple, berries, papaya, guava, pineapple, mango, avocado and dried fruit.

27 **Microbiome & Prebiotics**

- ▶ Nuts and seeds; walnuts, almonds, pistachios, cashews, Hazel nuts, Brazil nuts, flax seeds, sunflower seeds, pumpkin seeds, Chia, cranberries, raisins, apricot, Dates, prunes and figs.

28 **4. Inflammatory Process in the Mitochondria**

29 **Mitochondria**

- ▶ mitochondria of each cell is responsible for the energy output that drives the cell.
- ▶ As free radical damage occurs within the cell and the cell's mitochondria, the energy necessary to drive the cell diminishes until finally it dies.
- ▶ reversing the damage in the mitochondria will increase their energy output and thereby energize they're cell.

30 **Mitochondria**

- ▶ CONCEPT:
The more free radical damage in the mitochondria, the less it is able to produce energy.
The more energy the mitochondria can produce, the less it can be affected by free radical damage.

31 **5. Inflammation and Brain**

32 **Mitochondria in the Brain Cells**

- ▶ brain represented a very important part of the ageing process.
- ▶ density of mitochondria in the brain is greater then in all of the rest of the body combined.
- ▶ Inflammation in these organelles begin a deteriorating process that reduces the energy

available for the cells to function.

33 **Mitochondria in the Brain Cells**

- ▶ Since the cells collectively make up the organs, then as the energy in the cells diminish so too does the body's energy diminish.
- ▶ This includes the energy necessary to operate the heart sufficiently and is a major cause of cardiac myopathy.
- ▶ It goes without saying that the need to control inflammatory processes in these organs are primary to maintain adequate brain and heart function.
- ▶ The key to increasing energy output in the mitochondria therefore, is to reduce inflammation that is causing its decline (must be focus in our senior years).

34 **Inflammation by Free Radicals in Brain Cells**

- ▶ The incidence of inflammation in the ageing brain is manifold. Much of it is silent inflammation. All of it creates excessive free radicals.
- ▶ all metabolism creates free radicals as a normal consequence and in our younger years our body is able to create its own free radical quenchers like super oxide dismutase.
- ▶ As we age this ability diminishes. Therefore it is imperative that we look to our food to replace that which our bodies can no longer provide.
- ▶

35 **Inflammation by Free Radicals in Brain Cells**

- ▶ It is important to understand that inflammatory conditions can produce free radical damage and that the reverse can also be true.
- ▶ Free radical damage can be the cause of inflammation.
- ▶

36 **Inflammatory process in the Brain**

- ▶ chronic inflammation can become a systemic condition in the body and can re-manifest anywhere in the body where you are vulnerable
- ▶ same inflammatory process can begin in the brain as well.
- ▶ primary functions of the brain is concerned with neurological connections which facilitate its immense communication system, therefore, any inflammatory process can have immense damaging consequences.

37 **Inflammatory process in the Brain**

- ▶ While glutamate is responsible for over 50% of the neurotransmitting function of the brain, when there is an inflammatory process the brain produces an excess of glutamate in the area of and within the neuron cells affected by inflammation.

38 **Inflammatory process in the Brain**

- ▶ In the latest neurological studies on neurotoxicity and excitotoxicity, a new discipline of study in this field, it has thus far been determined that this excess production of glutamate has a devastating effect in the brain by causing an overload of excitation in the neurons affected and thereby causing them to die.

39 **6. Supplements**

40 **supplements for Healthy mitochondria**

supplements required for Healthy production of energy in the mitochondria and to protect it

from free radical damage.

- ▶ Vitamin C
- ▶ vitamin E complex including all 4 tocopherols and all 4 tocotrienols
- ▶ alpha-lipoic acid
- ▶ magnesium
- ▶ malic acid
- ▶

41 **supplements for Healthy mitochondria**

- ▶ coenzyme Q-10
- ▶ acetyl-L- carnitine
- ▶ omega 3 essential fatty acids including DHA and EPA
- ▶ complete vitamin B complex.
- ▶ L – methionine because of its ability to protect glutathione and the inner membrane of the
- ▶ mitochondria from free radical damage.
- ▶

42 **Ortho- molecular aids to reduce inflammation**

- ▶ Vit.C 600-1000 mg. 2-3x daily
(take Calcium, potassium or sodium ascorbate
as it make the ascorbic acid alkaline)
- ▶ Acetyl L Carnitine-500 mg. 2x daily
- ▶ Glutathione (amino acid)

43 **Ortho- molecular aids to reduce inflammation**

- ▶ Anti-inflammatories; cardio omega 3 seal oil 2-3 capsules 2x daily, depending upon the degree of discomfort or pain.

44 **Hand-out of Healthy Living Presentations**

You can download this (and previous handouts) from Life Transformation Institute's Website:

<http://tinyURL.com/healthhandouts>

45 **Resources**

46 **Resources**

Life Transformation Institute's website

<http://tinyURL.com/healthhandouts>

- Glossaries (Health, Heart, Heart Diseases)
- List of Health Magazines, Books
- Articles, Presentations ... more

Appendices of Book: "7 Steps to Dental Health"

<http://7stepsdentalhealth.com>

- Health Websites
- Health Organizations
- Glossary of Holistic and Dental Terms
- Dental Knowledge Test

47  **Dr. Russell Blaylock Videos about Brain**

▶ Brain care

https://www.youtube.com/watch?v=8u_MN-ZS-BE

▶ How to keep your brain from aging" part one

<https://www.youtube.com/watch?v=49RRFs8qIVE>

▶ How to keep your brain from aging" part two

https://www.youtube.com/watch?v=HcVgm_hskfw

▶ Excitotoxins, Neurotoxins & Human Neurological Disease Lecture

<https://www.youtube.com/watch?v=nxLm2LAPQo>

▶

48  **Presentation by Phil Feilds**

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